Modeling Of Compressible Flux Tubes on Solar Atmosphere

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The solar atmosphere is full of filamentary structures which we identify as flux tubes,arches and loops.They are embedded in an otherwise turbulent medium. We study the formation of discrete elements of a compressible turbulent magnetoplasma by imposing the conservation of mass,momemtum,energy,angular momentum,magnetic helicity and kinetic helicity in an ideal MHD but with finite and very large thermal conductivity.The condition of energy extrema while holding the other constraints at their fixed values yields the equilibrium profiles of mass density, flow velocity and magnetic field. It is found that depending on the parameters,hollow as well as the centrally peaked density profiles along with corresponding profiles of flow and magnetic fields can be obtained.This would help to model hollow but intense photospheric flux tubes and centrally peaked coronal loops.The issues related to the conservation of magnetic helicity or otherwise will be discussed along with its consequences for the equilibrium profiles.